The Nepal Survey on Malaria, Japanese Encephalitis and Kala-azar

The three priority vector-borne diseases (VBDs) in Nepal are malaria, Japanese Encephalitis (JE) and Kala-azar (KA). To assist the Nepal MOH address prevention and control of priority VBDs, a survey of the three VBDs was carried out by EHP/Nepal during 1999–2000 with support from USAID/Nepal.

Methodology

Nepal is divided into eco-regions (forest fringe, inner terai, outer terai, and highland river) and two zones (East zone and West zone). For the survey, selected districts in the East and West zones representing the eco-regions were surveyed at two time points (pre-monsoon and post-monsoon). Eight districts representing four eco-regions for malaria, and six districts each representing three eco-regions for JE and KA were selected. The survey included: a socio-behavioral household survey, an entomological survey with household and peri-household vector collection, and a clinical survey with blood sample collection. The survey complemented qualitative assessments and operations research that were ongoing at the time (e.g., malaria surveillance and sensitivity study, KA case control study, JE ecology study, etc.).

The Surveys

The *socio-behavioral survey* looked at: household characteristics such as literacy, ethnicity and socioeconomic status; disease awareness and knowledge (transmission and symptoms); and related behavior (use of bed nets, livestock management, and risk sleeping such as sleeping on the floor).

The *entomological survey* included: collection of adult vectors and larva from indoor human dwellings, animal sheds, and outdoor collection sites for malaria and JE and review of vector density and distribution.

The *clinical survey* focused on blood sample collection—blood smear for malaria, serology for JE and direct agglutination test (DAT) or K39 serologic test for KA.

Selected Findings

Awareness of Disease

- Unlike malaria, awareness of KA and JE was low. Seventy-seven percent of the respondents said they were aware of malaria compared to 32% who were aware of JE and 14% who were aware of KA.

- Increased awareness is associated with reduced risk behavior. Awareness influenced bed net use. For example, 75% used bed nets among those aware of malaria, compared to 56% using bed nets among those not aware. Similarly, among those aware of KA, 9% slept only on the floor (risk behavior for KA), compared to 11% among those not aware of the disease.

- Knowledge and awareness of VBDs increased with socioeconomic status, literacy and radio ownership. Awareness was also relative to the presence of disease in communities.

Awareness of Preventive Behaviors

- Although bed net use was high (70%) among households surveyed for malaria, 59% of the households had at least one household member unprotected (i.e., not all members using bed

nets). Similarly, 53% of the households surveyed for KA and 52% of the households surveyed for JE had at least one household member unprotected. Socioeconomic status and literacy were associated with complete bed net protection.

- The parasite for KA is transmitted by the sand fly, which breeds in mud and dung and feeds on livestock. The majority of households surveyed had household behaviors that encouraged vector breeding—livestock near the house, animal waste near the house, granary inside the house, and rat holes near the house. For example, among households with animal sheds near the house, 37% were vector positive, compared to 23% of those with sheds far away.

- Sleeping on the floor was a risk sleeping behavior related to KA. The vector sand fly breeds in mud. Eighty-seven percent of the houses had mud plaster floors, and 59% reported sleeping on the floor at least some of the time.

- Pigs are one of the main amplifying reservoirs/hosts for the JE virus. The survey showed high awareness (89%) of association of JE with pig farms and pig-raising practices. On the contrary, only 14% knew about the JE vaccine.

Environmental Interventions

- Spraying is one environmental intervention currently implemented by His Majesty's Government of Nepal. Respondents did not see spraying as a highly valued intervention. Among households surveyed for malaria, nearly half (47%), whose houses were sprayed, plastered or painted their houses within a few months—85% did so within three months.

- Most felt clearing/cleaning the environment would reduce risk.

- Most felt it was the government's responsibility to control vector borne-diseases.

- Most felt the community should do more to clear/clean the environment, but few understood breeding sites.

Health Infrastructure

- Most mentioned health facilities as sources of care, but less than 20% had confidence in the services provided.

- Understanding of signs and symptoms was highest for malaria and lowest for JE and KA. Understanding of disease management was better when health workers were a source of information.

Possible Interventions

- Community education campaigns:

  - to increase awareness of disease, self diagnosis and referral

  - to reduce risk behaviors (sleeping without bed nets, sleeping on the ground floor, improving live stock and pig-raising practices)

  - to improve preventive behaviors (vaccination for JE)

  - to improve reporting of VBDs

- Community campaigns to reduce breeding sites

- Training of heath staff to be active educators

- Training of health staff on case recognition and management, linking reported data to intervention strategies.

The full report, EHP Activity Report 121: *Nepal: Analysis of Baseline Survey Data on Japanese Encephalitis, Kala-azar and Malaria*, can be downloaded from the EHP website: http://www.ehproject.org.

To request a hard copy of the report, please email info@ehproject.org.